REMARKS

Claims 26-30 are currently pending in the subject application, and are presently under consideration. Claims 26-30 stand rejected. Claims 1-25 have been cancelled. Claims 26-28 have been amended. New claims 31-35 have been added. Favorable reconsideration of the application is requested in view of the amendments and comments herein.

I. Claim Rejections Under 35 U.S.C. § 112, First Paragraph

Claims 26-30 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. The Examiner has cited that the amendment to claim 26, submitted on November 21, 2005, in the Response to Election Requirement dated October 24, 2005, is an exact opposite limitation of that described in paragraph **[0007]** of the Specification. It is respectfully submitted that paragraph **[0007]** has been amended in the Amendments to the Specification section on page 2 of this paper to correct the same typographical error that was corrected in the original amendment of claim 26. It is further respectfully submitted that the elements recited in the previously amended claim 26 satisfy the written description requirement of 35 U.S.C. §112, first paragraph. In particular, the Specification provides such satisfaction of the written description requirement of 35 U.S.C. §112, first paragraph as follows:

> FIG. 9 illustrates an alternate methodology for determining a cost associated with a selected objective from a plurality of objectives. At 200, cost are generated for a value set based on a non-selected objective *if the value set does not meet constraints* associated with the non-selected objective and on a selected objective *if the value set does meet constraints* associated with the non-selected objective. At 210, at least one value set variation is generated based on value sets with lower costs. At 220, the generating of a cost based on one of the non-selected objective and the selected objective is repeated for the at least one value set variation. (Present Application, paragraph **[0049]**, emphasis added).

Withdrawal of the rejection of claims 26-30 under 35 U.S.C. §112, first paragraph, is respectfully requested.

II. Rejection of Claim 26 Under 35 U.S.C. §102(e)

Claim 26 stands rejected under 35 U.S.C. §102(e) as being anticipated by U. S. Patent No. 6,910,192 to McConaghy ("McConaghy"). Claim 26 has been amended. Withdrawal of this rejection is respectfully requested for at least the following reasons.

Claim 26 has been amended to clarify that costs are generated for the value set at either the first cost range and the second cost range. Specifically, claim 26 recites generating a first set of parameters associated with a non-selected objective and a second set of parameters associated with a selected objective, the first and second set of parameters being based on a value set, generating costs for the value set at a first cost range based on the first set of parameters if the first set of parameters do not meet constraints associated with the non-selected objective, and generating costs for the value set at a second cost range based on the second set of parameters if the first set of parameters do meet constraints associated with the non-selected objective, the first cost range being substantially higher than the second cost range. Representative for Applicant respectfully submits that McConaghy does not teach each and every element of claim 26, and thus does not anticipate claim 26.

The Office Action dated February 10, 2006 ("Office Action"), asserts that generating a first set of parameters associated with a non-selected objective and a second set of parameters associated with a selected objective, the first and second set of parameters being based on a value set, as recited in claim 26, is taught by McConaghy. Specifically, the Office Action states that McConaghy teaches "determining at least one function value for each objective function," (Office Action, page 3, citing McConaghy, col. 3). Representative for Applicant respectfully disagrees.

As recited in claim 26, a selection of an objective is performed to optimize a solution based on the selected objective so long as a non-selected objective meets acceptable constraints. McConaghy teaches a robust search engine to solve technological design problems (McConaghy, Abstract). The methodology of McConaghy dictates that a number of randomly chosen design candidates undergo a tournament, the winner of the tournament being based on objective

function values (McConaghy, col. 6, ll. 51-63 and col. 7, ll. 33-45). However, McConaghy further teaches that a feasible solution is chosen from candidates that meet a certain minimum objective function value requirement (McConaghy, col. 9, ll. 19-23). In the discussion of FIG. 6, McConaghy teaches that it may be impossible to ascertain which candidates are better in the feasible region because of different constraint trade-offs, and that different solutions can be left to choice by designers based on the trade-off (McConaghy, col. 9, ll. 28-36). Because McConaghy emphasizes the concept of trade-offs between different constraints, it is respectfully submitted that McConaghy does not teach selectivity amongst objectives. Even if the objective functions in McConaghy are weighted, McConaghy still does not teach selection of an objective for optimization of a solution based on that selected objective, as the phrase "selected objective" is defined for purposes of claim 26, because the trade-off aspect of McConaghy is such that no one objective function in McConaghy is optimized over another, even if objective functions are differently weighted. Therefore, McConaghy does not teach generating a first set of parameters associated with a non-selected objective and a second set of parameters associated with a selected objective, as recited in claim 26.

The Office Action also asserts that generating costs for the value set at a first cost range based on the first set of parameters if the first set of parameters do not meet constraints associated with the non-selected objective, as recited in claim 26, is taught by McConaghy by stating that McConaghy teaches "determining estimators of design quality." (Office Action, page 3; citing McConaghy, col. 3 and col. 5). Representative for Applicant respectfully disagrees with this assertion.

As described above, McConaghy teaches that a number of randomly chosen design candidates undergo a tournament, the winner of the tournament being based on objective function values, and that a feasible solution is chosen from candidates that meet a certain minimum objective function value requirement (McConaghy, col. 6, ll. 51-63, col. 7, ll. 33-45, col. 9, ll. 19-23). The discussion of FIG. 6 in McConaghy is directed toward choosing between candidates that have satisfied both the objective function value constraints on each axis of the graph in FIG. 6 (McConaghy, FIG. 6, col. 9, ll. 19-36). Therefore, the invention of McConaghy

does not evaluate candidates that *do not* meet the constraints of the objective functions. Accordingly, McConaghy does not teach generating costs for the value set at a first cost range based on the first set of parameters if the first set of parameters do not meet constraints associated with the non-selected objective. In addition, as is further apparent in the discussion of FIG. 6 of McConaghy, McConaghy teaches that candidates are chosen based on their relative values within the acceptable region of the two objective functions, cost and makespan (McConaghy, FIG. 6, col. 9, ll. 19-36). Thus, McConaghy teaches candidate choices between acceptable candidates using a tradeoff between cost and makespan. Cost is one of two objective functions, and costs associated with one objective function are thus not generated based on whether a separate objective function has met constraints, as taught by McConaghy. Therefore, McConaghy does not teach both a selected objective and non-selected objective, and generating costs for the value set at a first cost range based on the first set of parameters if the first set of parameters do not meet constraints associated with the non-selected objective, as recited in claim 26. The Office Action's assertion that "determining estimators of design quality" is misplaced because it does not take into account that cost is an objective function in the teachings of McConaghy, that the costs are generated based on an objective not meeting constraints in claim 26, and that cost is not associated with "design quality" in the language of claim 26.

The Office Action further asserts that generating costs for the value set at a second cost range based on the second set of parameters if the first set of parameters do meet constraints associated with the non-selected objective, the first cost range being substantially higher than the second cost range, as recited in claim 26, is taught by McConaghy. Specifically, the Office Action asserts that this claim element is taught by stating that McConaghy teaches "costs being the quality estimators or best fitness values which are used to determine the best candidates for the evolutionary algorithm." (Office Action, page 3, citing McConaghy, col. 3, col. 5, and col. 7, ll. 30-67). Representative for Applicant respectfully disagrees with this assertion.

As described above, McConaghy teaches that candidates are chosen based on their relative values within the acceptable region of the two objective functions, cost and makespan (McConaghy, FIG. 6, col. 9, ll. 19-36). Assuming *arguendo* that McConaghy can be considered

to teach generating costs for a value set at a cost range, the only cost range that can be considered in the teachings of McConaghy is the range above the acceptable region in the cost restraint. McConaghy is silent as to a second, distinct cost range. Therefore, McConaghy does not teach generating costs for the value set at a first cost range based on the first set of parameters if the first set of parameters do not meet constraints associated with the non-selected objective; and generating costs for the value set at a second cost range based on the second set of parameters if the first set of parameters do meet constraints associated with the non-selected objective, the first cost range being substantially higher than the second cost, as recited in claim 26. The Examiner's assertion that McConaghy teaches "costs being the quality estimators or best fitness values which are used to determine the best candidates for the evolutionary algorithm" does not appreciate that claim 26 recites two separate and distinct cost ranges.

For all of the reasons described above, McConaghy does not teach each and every element of claim 26. Therefore, McConaghy does not anticipate claim 26. Withdrawal of the rejection of claim 26, as well as claims 27-35 which depend therefrom, is respectfully requested.

II. Rejection of Claims 27-30 Under 35 U.S.C. §103(a)

Claims 27-30 stand rejected under 35 U.S.C. §103(a) as being unpatentable over McConaghy in view of U.S. Patent No. 6,578,176 to Wang et al. ("Wang"). Claims 27 and 28 have been amended. Withdrawal of this rejection is respectfully requested for at least the following reasons.

Amended claim 27 depends from claim 26 and recites storing value sets and associated costs as chromosomes in a chromosome pool, each value set having an associated cost that is either in the first cost range or the second cost range, and executing a genetic algorithm on the stored value sets to generate value set variations based on chromosomes in the chromosome pool with lower costs. Amended claim 27 also recites generating costs for the value set variations at the first cost range based on the first set of parameters if the first set of parameters do not meet constraints associated with the non-selected objective, generating costs for the value set variations at a second cost range based on the second set of parameters if the first set of

parameters do meet constraints associated with the non-selected objective, and storing value set variations and associated costs as chromosomes in a chromosome pool, each value set variation having an associated cost that is either in the first cost range or the second cost range.

As described above, McConaghy does not teach the elements of claim 26, from which claim 27 depends. The Office Action relies on Wang to teach the elements of claim 27 (Office Action, page 4). Wang teaches a genetic algorithm to optimize integrated circuit designs for power dissipation (Wang, Abstract). However, Wang does not cure the deficiencies of McConaghy to teach or suggest separate distinct cost ranges as recited in claim 26, from which claim 27 depends. In addition, neither McConaghy nor Wang, individually or in combination, teach or suggest claim 27. Withdrawal of the rejection of claim 27, as well as claims 28-30 which depend therefrom, is respectfully requested.

III. New Claims 31-35

New claim 31 depends from claim 26 and recites generating a third set of parameters associated with at least one additional non-selected objective, and generating costs at a third cost range based on the third set of parameters if the third set of parameters do not meet constraints associated with the at least one additional non-selected objective, the third cost range being substantially greater than the first cost range and being one of substantially greater than the second cost and substantially less than the second cost range. Neither McConaghy nor Wang, individually or in combination, teach or suggest new claim 31. Consideration and allowance of new claim 31 are respectfully requested.

New claim 32 depends from claim 26 and recites that the non-selected objective is slack constraints associated with a circuit design configuration and the selected objective is power constraints associated with the circuit design configuration. Neither McConaghy nor Wang, individually or in combination, teach or suggest new claim 32. Consideration and allowance of new claim 32 are respectfully requested.

New claim 33 depends from new claim 32 and recites evaluating the costs for at least one cell block based on a slack cost function that provides costs at the first cost range if timing

parameters do not meet slack constraints and evaluating the costs for the at least one cell block based on a power function that provides cost at the second cost range if the timing parameters do not meet slack constraints. Neither McConaghy nor Wang, individually or in combination, teach or suggest new claim 33. Consideration and allowance of new claim 33 are respectfully requested.

New claim 34 depends from new claim 33 and recites that the slack cost function is based on evaluating the equation Cost = M + C * ($Slack_{Actual}$ - $Slack_{Max}$), where M and C are constants substantially greater than one, $Slack_{Actual}$ is the actual slack associated with the at least one cell block and $Slack_{Max}$ is the maximum allowable slack associated with the at least one cell block, and the power cost function is based on evaluating the equation Cost = Power, where power is equal to the evaluated power of the at least one cell block. Neither McConaghy nor Wang, individually or in combination, teach or suggest new claim 34. Consideration and allowance of new claim 34 are respectfully requested.

New claim 35 depends from new claim 34 and recites that storing value sets and associated costs at both the first cost range and the second cost range as chromosomes in a chromosome pool, executing a genetic algorithm on the stored value sets to generate value set variations based on selecting parent chromosomes in the chromosome pool with lower costs, the genetic algorithm selecting value sets and value set variations from the first cost range if $Slack_{Actual} > Slack_{Max}$ and selecting at least one value set and value set variation from the second cost range upon at least one chromosome having $Slack_{Actual} < Slack_{Max}$, generating costs for the value set variations at the first cost range based on the first set of parameters if the first set of parameters do not meet constraints associated with the non-selected objective, generating costs for the value set variations at the second cost range based on the second set of parameters if the first set of parameters do meet constraints associated with the non-selected objective, and storing value set variations and associated costs as chromosomes in a chromosome pool, each value set variation having an associated cost that is in one of the first cost range and the second cost range. It is respectfully submitted that claims 34 and 35 are directed to the concept that is illustrated in paragraph 36 of the Present Application, that slack difference is employed to select parent

chromosomes from lower cost chromosomes that are closer to meeting the slack constraints, until slack constraints have been met. Neither McConaghy nor Wang, individually or in combination, teach or suggest new claim 35. Consideration and allowance of new claim 35 are respectfully requested.

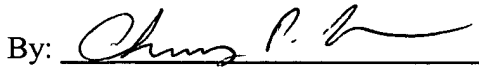
CONCLUSION

In view of the foregoing remarks, Applicant respectfully submits that the present application is in condition for allowance. Applicant respectfully requests reconsideration of this application and that the application be passed to issue.

Should the Examiner have any questions concerning this paper, the Examiner is invited and encouraged to contact Applicant's undersigned attorney at (216) 621-2234, Ext. 106.

No additional fees should be due for this response. In the event any fees are due in connection with the filing of this document, the Commissioner is authorized to charge those fees to Deposit Account No. 08-2025.

Respectfully submitted,

By: 

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